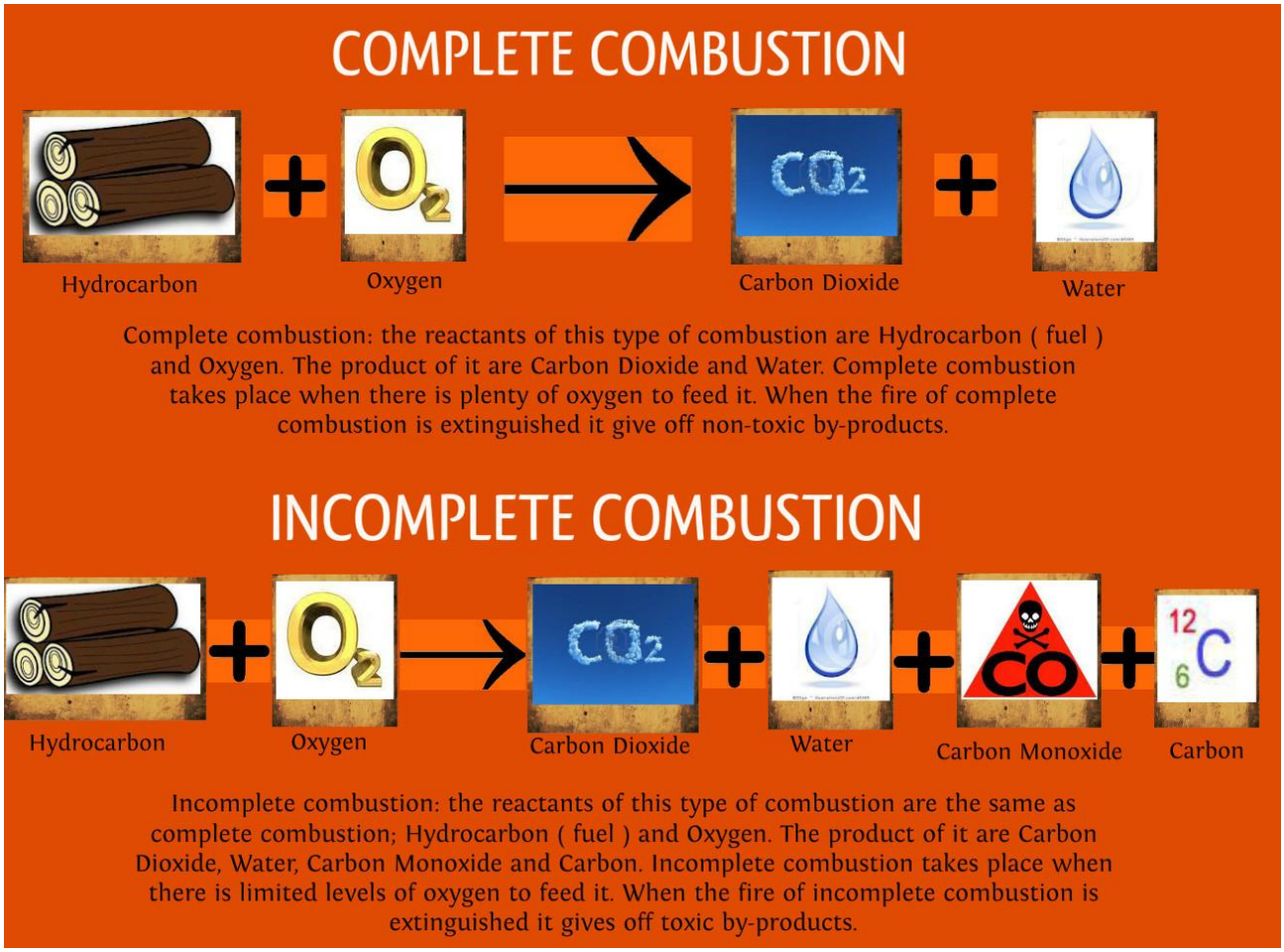
REACTIONS OF HYDROCARBONS

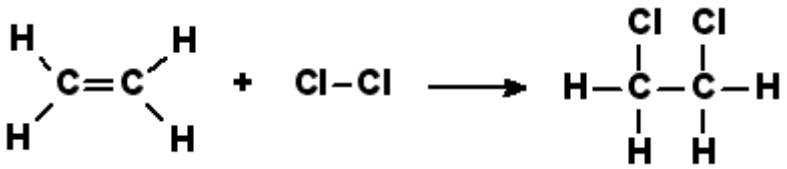
A. Combustion Reactions –

- all hydrocarbons will burn in air to produce large amounts of light and heat
- hydrocarbon + $O_2 \rightarrow CO_2 + H_2O$ (complete combustion)
- hydrocarbon + $O_2 \rightarrow CO_2 + CO + H_2O + C$ (incomplete combustion)



B. Addition Reactions

- a reaction of an alkene or alkyne in which a molecule, such as hydrogen or a halogen gas (HOFBrINCl), is added to a double or triple bond
- double and triple bonds are easily converted to lesser bonds
- eg: ethene + $Cl_2 \rightarrow$ 1,2-dichloroethane



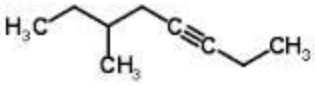
- **saturated –** contains the maximum number of single bonds (ALKANES)
- **unsaturated –** contains at least one double or triple bonds (CYCLOS/ALKENES/ALKYNES)

REACTIONS QUESTIONS:

1. Determine whether each of the following are saturated or unsaturated.

   a. C_7H_{16}

   b. $CH_3CHCHCH_2CH_3$

   c. 

   d. C_8H_{14}

2. Write a b equation for the combustion of each of the following hydrocarbons.

   a. nonane

b. 2-heptene

c. ethyne

3. Complete the following addition reactions, and demonstrate the reaction using structural formulae.

a. 3-decene + hydrogen gas →

b. 2-heptyne + chlorine gas →